Summary Report on Long-term Bird Monitoring Efforts
by the Klamath Bird Observatory in 2005

Robert I. Frey and John D. Alexander

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Background

The Klamath Bird Observatory (KBO) continued its comprehensive, long-term bird monitoring program in the Klamath Bioregion of northern California and southern Oregon during 2005. The objectives of this program are to collect data that provide an index to species diversity and abundance in riparian and upland habitats, to evaluate the reproductive success and population health of Neotropical migratory and resident birds, to maintain a long-term monitoring effort for tracking landbird population trends, and to test methods for effectively monitoring special species. The Klamath Bioregion lies within the Partners in Flight (PIF) Pacific and Intermountain West Avifaunal Biomes, which includes 35 bird species identified as focal species for conservation and monitoring efforts (Altman 1999, 2000, Rich *et al.* 2004; Tables 1*a* and 1*b*). KBO's monitoring efforts are part of a regional program that started in the early 90s (Klamath Demographic Monitoring Network; Alexander *et al*. 2004).

As a part of this program, during 2005 KBO maintained a long-term effort to track population trends and demographics at constant effort mist-netting stations, breeding bird census routes and extensive point count census routes throughout the Bioregion. The census efforts are documented in a separate report (Stephens and Alexander 2005). This report is focused on the summary of 2005 Constant-Effort Stations (CES), Rapid Ornithological Inventories (ROI), Special Species Monitoring, Technical Training, and Outreach efforts. These efforts were designed and completed in close collaboration with the US Forest Service Redwood Sciences Laboratory (RSL). KBO also continued efforts toward developing its role as a support source for regional research and monitoring projects by providing technical assistance, training, and consultation to cooperating individuals, organizations, and agencies. This report provides a brief summary of our 2005 efforts and results. Cooperators who contribute to this Oregon-Washington and California PIF long-term monitoring effort include: Ashland School District; Bureau of Land Management Lakeview and Medford Districts; Bureau of Reclamation; Ford Family Foundation; Jackson and Klamath counties, Oregon; National Fish and Wildlife Foundation; National Park Service Oregon Caves National Monument; PacifiCorp; PRBO Conservation Science; Southern Oregon University; US Fish and Wildlife Service Non-game Landbird Program and Klamath Basin Refuge Complex; Klamath, Rogue River-Siskiyou National Forests and Fremont- Winema National Forests; and others.

In 2005, KBO continued to work with our partners to fulfill monitoring objectives defined by the National PIF Inventory and Monitoring Working Group (Hussell and Ralph 1998) and contributes toward our mission to advance bird and habitat conservation through science, education, and international, national, and local partnerships. Although KBO's monitoring efforts consist of study sites in a variety of habitat-types at the

landscape-level, in this report we synthesize our efforts into two groups of distinct landscapes (i.e., *Eastside Cascade Range – Klamath Basin* and *Westside Cascade Range – SW Oregon and NW California*).

Constant-Effort Monitoring

Overall Monitoring Summary

KBO operated 15 constant-effort stations (CES) in the Klamath Bioregion during 2005. Our protocol for conducting long-term monitoring using CES (Ralph *et al.* 2004) includes mist net arrays, banding, area search and point count censusing, vegetation surveys, and DNA sampling and is consistent with the recommendations of Partners In Flight (Hussell and Ralph 1998). The methods used are as described in Ralph *et al.* (1993) and are designed to provide distribution, abundance and demographic information. The CES efforts begin each year in May, at the onset of the landbird breeding season, and continue through October, inclusive of the fall migration. Our flagship CES at the Willow Wind Learning Center in Ashland, Oregon is operated throughout the year. Exact locations of the study sites have been recorded in KBO's GIS database and the physical characteristics for each site were described using a location and vegetation releve' survey method recommended by Ralph *et al.* (1993). The Snow – Cow Creek CES was discontinued and a new CES established on Quines Creek in Douglas County, Oregon. Written descriptions of site localities are included (Table 2).

Combined totals from these 15 CES include 10,099 birds captured during 12,430.48 net hours (number of 12 m mist nets operated multiplied by time operated in hours) and 439 area search censuses completed, all during 255 efforts with 662 person-days (Tables 3 and 4). Point count census and location–vegetation stations have been established at each CES as described by Ralph *et al.* (1993), complementing the long-term trend data being collected at those sites. The methods used gather distribution, abundance, and demographic information on over 200 species in the Klamath Bioregion, including many identified by PIF in continental and regional habitat conservation plans as priority or focal species (Altman 1999, 2000, Rich *et al.* 2004; Table 1).

Special Species Monitoring

In following recommendations of the National PIF Inventory and Monitoring Working Group, KBO has established special species monitoring programs for birds that are inadequately monitored by other programs or methods (Altman and Bart 2001, Shuford 1999). Our special species monitoring efforts are comprised of small owl capture and censusing throughout the Klamath Bioregion and Black Tern nesting colony surveys within the Klamath Basin.

Small Owls

In an effort to develop an effective small owl monitoring method, RSL and KBO have conducted pilot mist netting and census with audio-lure. The target species of these efforts are Flammulated Owl, Western Screech-Owl, Northern Pygmy-Owl, and Northern Saw-whet Owl. Little is known about the distribution, population trends, demographic composition, and migration patterns of these birds in western North America. We have incorporated these efforts into the ongoing CES efforts in the Klamath Demographic Monitoring Network at appropriate stations since 2000.

The goal of our small owl monitoring program has been two-fold. First, we have sought to develop effective monitoring methods for this group of birds that are difficult to study; and secondly, to build upon the limited body of knowledge of small owls in the Pacific Northwest. The small owl capture and censusing methodology involves the use of audio-lure, that is, the broadcast of vocalization recordings of targeted species in proximity to mist nets and census point. A small array of mist nets are opened and 20-minute censuses are conducted while the audio-lure is broadcast.

Black Terns

In partnership, KBO and RSL have developed a Black Tern nest colony monitoring program in the Klamath Basin. We have implemented this monitoring program since 1996. The Black Tern monitoring effort involves visual surveys completed from shore, canoe, and boat. The surveys consist of routes containing 6-12 points that have been mapped using GIS.

Neotropical Migratory Bird Conservation Genetics Project

Since 1999, KBO has contributed to the University of California Los Angeles Center for Tropical Research's (CTR) Neotropical Migratory Bird Conservation Genetics Project. The CTR is investigating the genetic structure of migratory bird populations in order to match breeding areas in North America with wintering areas in Latin America and the Caribbean. This area of research seeks to determine the factors responsible for population declines of Neotropical songbirds that migrate between Central America, Mexico, the U.S., and Canada. Despite efforts, researchers have been unable to identify discrete breeding and wintering populations of individual species. This has made relating population declines with likely causes, such as land use changes, extremely difficult. Using molecular genetic techniques (utilizing DNA obtained from a single feather from a bird), CTR researchers have been able to identify the breeding and wintering populations of songbirds. These findings will provide conservation biologists with the means of correlating habitat changes (e.g., urbanization, deforestation, etc.) with the declining populations. Demographic data contributed by KBO and other monitoring programs are integral to the CTR's research efforts.

Eastside Cascade Range – Klamath Basin

Constant-effort Stations (CES)

From 20 May through August (breeding season), all CES sites were scheduled operated once every 10 days. In September and October (migration season) All but the Rocky Point cabin (CABN) site were scheduled and operated once per week . The CABN site had an increased frequency of efforts operated on a three day schedule during fall migration. . At the nine Eastside CES we completed 146 banding efforts from 15 May through 31 October and expended 390 person days. A total of 6,069 birds were captured during 7,312.71 net hours and 241 area search censuses were conducted (Table 3).

The CABN site had the highest total captures (1,352 individuals), as well as the highest capture rate with 1.19 captures per net hour. The Sevenmile Guardhouse Station (7MIL), Frain Ranch Topsy Grade (TOPS), and Williamson River Campground (WILL) sites followed with the next highest total captures with 868, 697, and 644 respectively. The CABN, 7MIL, Odessa Marsh Campground (ODES), and WILL sites followed with average species richness values of over 14.0 over the season (Table 3). Each of these latter sites are located at Upper Klamath Lake (Table 2).

During the breeding season, from May through August, the 7MIL site had the highest total captures (553), followed by the TOPS and CABN sites (466 and 396, respectively). The TOPS (1.20), CABN (0.92), and Wood River Wetland (WOOD; 0.76) sites had the highest capture rates. The TOPS site had the greatest average species richness with 15.8 average species captured per visit over the season, followed by ODES (13.8), CABN, and Johnson Creek (JOHN; both 12.6). During the breeding season a total of 2947 birds were captured at the nine CES during 4,218.48 net hours. A total of 135 area search censuses were completed during the 85 efforts with 213 person-days (Table 3).

During the fall migration season the CABN site had the highest total captures with 956. Although this site was scheduled for an increased frequency of efforts, it also had the highest capture rate at 1.35 birds per net hour. The WILL site had the next highest total captures and capture rate with 355 and 1.29, respectively. The CABN site also had the greatest average species richness per visit (16.8) over the season. The 7MIL and CABN sites had the next greatest average species richness with 16.0 and 15.9, respectively. During migration a total of 3,122 birds were captured at the nine CES during 3,094.23 net hours. A total of 106 area search censuses were completed during the 61efforts with 177 person-days (Table 3).

Rare or unusual species captured on the eastside during 2005 included a Black-and-white Warbler at the WOOD site in June. This species is described as a regular transient west of the Rocky Mountains by Nehls (2003).

Special Species Monitoring - Small Owl Monitoring

In 2005, KBO continued to compare two types of audio-lure use. Previous efforts utilized an audio-lure recording of the four target species rotated in a repeating broadcast. This past field season, we alternated use of this combined-species recording with a single-target species recording broadcast, between site efforts. There were 12 netting efforts completed totaling 82.75 net hours. During these efforts 18 surveys were completed.

Special Species Monitoring - Black Tern Nest Colony Surveys

During May through early July, observers conducted 29 Black Tern surveys by canoe, motorboat, and from shore. During these surveys, 768 Black Terns were counted and no juvenile Black Terns were observed. Nesting colonies were identified or suspected along 15 routes in the following areas surveyed: Agency Straits; confluence of Crystal Creek, Recreation Creek, and Wocus Cut; Pelican Bay; NW shore and canals of Upper Klamath Lake; and Wood River Wetland (Table 5).

Westside Cascade Range - SW Oregon and NW California

Constant-effort Stations (CES)

From 20 May through August (breeding season), all CES sites were scheduled once per 10-day cycle beginning at graduated starts. The Willow Wind (WIWI) site is scheduled year-round once per week except as described below. The Quines Creek (QUIC) and Wildlife Images (WIIM) sites had an increased frequency of efforts scheduled for the fall migration season. Beginning the third week of August through the third week of October, the QUIC site was scheduled twice per week. Beginning the first week of September through October, the WIIM site was scheduled once per three-day cycle. All other sites were scheduled once per week beginning the first week of September through October for the fall. At the six Westside CES and single ROI sites, 109 banding efforts were completed from 15 May through 31 October and expended 272 person days. A total of 4,030 birds were captured during 5,117.77 net hours and 198 area search censuses were conducted (Table 4).

The Wildlife Images (WIIM) site, with increased scheduled efforts had the highest total captures with 1,619 individuals. The WIWI site and Horse Creek Meadow (HCME) followed with 767 and 590, respectively. The HCME site had the highest capture rate with 1.86 birds captured per net hour, followed by the WIIM (1.10) and WIWI (0.89) sites. The HCME site had the greatest average species richness, along with the WIIM site, with 14.0 species captured per effort visit over the entire season, followed by the WIWI site with 11.6 (Table 4).

The WIIM site had the highest total captures (447), followed by the HCME (289) and QUIC (280) sites. The HCME site had the highest capture rate with 1.72 birds per net hour, followed by the WIIM (0.95) and Oregon Caves (ORCA; 0.58) sites. The HCME

(14.7), WIIM (12.8), and QUIC (10.7) sites had the greatest average species richness During the breeding season, total of 1,648 birds were captured at the four CES and the Box-O Ranch (BOXO) ROI during 2,518.57 net hours. A total of 95 area search censuses were completed during the 54 breeding season efforts (Table 4).

The WIIM, WIWI, and HCME sites had the highest total captures with 1,172, 513, and 301, respectively. The HCME had the highest capture rate with 2.00 birds per net hour, followed by the WIWI (1.33) and WIIM (1.26) sites. The WIIM (15.2), WIWI (14.1), and HCME (13.3) sites had the greatest average species richness During the fall migration season, a total of 2,382 birds were captured at the four CES sites during 2599.20 net hours. A total of 103 area search censuses were completed during the 55 fall migration season efforts (Table 4).

The WIWI site is operated year-round and provides KBO with valuable environmental education and public outreach opportunities. Year-round monitoring at this site also provides early and late arrival information for migratory species in the Rogue Valley.

Rare or unusual species captured during 2005 at Westside CES included a Wilson's Warbler in December at the WIWI site. This Neotropical migratory species has been reported during the winter months in the Rogue Valley of southern Oregon just once before (Janes *et al.* 2001).

Special Species Monitoring - Small Owl Monitoring

In 2005, KBO conducted a total of 5 owl monitoring efforts at ROI and CES sites. Netting and census efforts were conducted at the Cascade Siskiyou National Monument Box-O Ranch ROI site and QUIC CES sites. During efforts a total of 7 censuses were completed while compiling 46.75 net hours.

Technical Training

Since the outset of its overall monitoring program, KBO has provided technical training in bird banding methods and bird conservation outreach and education opportunities at CES sites. KBO's monitoring program has been integrated with a bird banding internship program, which provides specialized technical training for students and biologists. In addition to this on-going training, KBO has provided intensive bird banding techniques training at these sites during on-going monitoring efforts during the field season for many professionals from academic and land management agencies.

Training in the latest and most effective bird monitoring techniques is an integral component of KBO's monitoring program. In 2005, a total of 11 college-level intern students, including 2 international students, received experiential instruction in advanced bird banding and survey techniques. Our international internship program is made possible through our partnerships with the Southern Oregon University International Studies Program. The instruction is supplemented with study materials, published by the North American Banding Council, pertinent scientific literature, and regular seminars

presented by KBO staff. Our student interns were given full registration at the Cooper Ornithological Society in June, where many scientific papers and workshops were presented, providing a valuable professional meeting experience for these student-scientists.

As part of our long-standing partnerships with the BLM Medford and Lakeview Districts, the Fremont-Winema National Forest, and the USGS Army Corps of Engineers, agency biologists were provided experiential training in banding techniques during monitoring efforts at several CES sites. These training sessions totaled 19 person days. Also, in partnership with the National Park Service Oregon Caves National Monument, a Service volunteer received experiential training in banding and survey techniques at the ORCA site over 17 person days.

A mid-season workshop was presented in early August for Klamath Demographic Monitoring Network cooperators and other regional researchers in early August at KBO's Upper Klamath Lake Field Station. Participants received instruction in advanced landbird ageing and sexing techniques, standard biometrics, mist net use and care, and general field safety principles. KBO also hosted an intensive, 1-day training session for the Evergreen State College (WA) Ornithology Class at the 7MIL site in May. KBO interns and staff provided assistance to Klamath Demographic Monitoring Network cooperators and other regional researchers that totaled 14 person-days.

In partnership with the Ford Family Foundation, an excellent learning experience was continued from 2004 for a Student Internship with KBO during 2005. This talented Southern Oregon University student worked with KBO staff in designing an internship curriculum that has provided hands-on experience in several areas. These experiences included assisting with field data collection with censusing and invertebrate surveys, mist netting and banding Outreach presentations; developing interpretive materials; and administrative tasks that helped expand our organizational capacities in outreach efforts and fundraising.

Toward the fulfillment of the North American Banding Council (NABC) mission of promoting sound and ethical banding principles and techniques, KBO coordinated four NABC Bander and Bander Trainer Certification Evaluation sessions during 2005 and cooperated on another with our affiliate the Humboldt Bay Bird Observatory at Arcata, California. Three of these were Individual evaluations and the fourth and fifth group sessions. From these evaluations 7 of our interns were certified at the NABC Bander and/or Bander Trainer level.

Outreach and Education Integrated with Monitoring Efforts

The on-going monitoring efforts conducted by KBO have created many excellent outreach and education opportunities that have reached hundreds of students (K-12 and college-level) as well as many community members and KBO-partner representatives.

Bird banding provides a unique opportunity to educate the public and students in bird conservation principles. KBO's Outreach Program worked in concordance with its long-term monitoring efforts in creating many such academic and public outreach opportunities in 2005. Overall, 287 people visited our banding sites during field trips and demonstrations at CES, ROI, and public parks. The Willow Wind site was especially active as an outdoor laboratory that is accessible and is scheduled for school and community group outreach efforts within our long-term monitoring protocol. Outreach events at KBO CES sites included 23 person-days of KBO-partner and interested conservation worker visits. In late July, KBO biologists and interns hosted a group of Mt. Hood Community College exchange biology students from several Central America countries at the ODES site. In late September, KBO hosted a field trip visit to the CABN site by the Klamath Basin Audubon Society and a group of local artists participating in a community arts program sponsored by the Jefferson Nature Center (Medford, OR).

Conclusion

The Klamath Bird Observatory's long-term bird monitoring program utilizes multiple methods, at a landscape level, to monitor bird populations during the breeding and fall migration seasons. Integral components of this monitoring program are technical training and outreach efforts. Our program includes lands that are managed by the Ashland School District, US Forest Service, Bureau of Land Management, US Fish and Wildlife Service, Bureau of Reclamation, National Park Service, and others. We are collecting data on population trends, habitat relationships, and demographic parameters throughout the Klamath Bioregion in order to inform managers about important bird habitats and the effects of resource management practices on birds. Data resulting from these efforts are contributed to several databases including the USGS North American Bird Banding Laboratory, the Institute for Bird Populations' Monitoring Avian Productivity and Survivorship program, the Klamath Demographic Monitoring Network, and the North American Migration Monitoring Network of the Americas.

In 2006, KBO will continue working with our partners to maintain this Oregon-Washington and California PIF long-term monitoring program, that fulfills monitoring objectives set forth by the National PIF Inventory and Monitoring Working Group (Hussell and Ralph 1998) and fulfills, in part, our mission to advance bird and habitat conservation through science, education, and effective partnerships at the international, national, and local levels.

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Tables

Table 1*a* . List of Focal Species included in Partners in Flight Landbird Consevation Plans for coniferous forests of western Oregon and Washington (Altman 1999) and east-slope of Cascade Mountains in Oregon and Washington (Altman 2000) for which the Klamath Bird Observatory gathers distribution, abundance, or demographic information at constant effort mist netting stations in southern Oregon and northern California.

White-headed Woodpecker
Pygmy Nuthatch
Chipping Sparrow
Williamson's Sapsucker
Hermit Thrush
Flammulated Owl
Olive-sided Flycatcher

Table 1*b* . List of Partners in Flight Watch List and Stewardship Species occurring in the Pacific and Intermountain West Avifaunal Biomes for which the Klamath Bird Observatory gathers distribution, abundance, or demographic information at constant effort mist netting stations in southern Oregon and northern California [*Watch List Species; **Stewardship Species] (Rich *et al.* 2004).

Oak Titmouse*
Wrentit*
Hermit Warbler*
Rufous Hummingbird*
Willow Flycatcher*
Pacific-slope (Western) Flycatcher**
Chestnut-backed Chickadee**
Golden-crowned Sparrow**
Red-breasted Sapsucker**
White-headed Woodpecker*
Varied Thrush**
Black-throated Gray Warbler**
Steller's Jay**
Western Scrub-Jay**
Fox Sparrow**
Flammulated Owl*
Winter Wren**
Cassin's Finch**
Gray Flycatcher**
Calliope Hummingbird*
Williamson's Sapsucker**
Green-tailed Towhee**
Dusky Flycatcher**

Table 2. List of 2005 Klamath Bird Observatory Constant-Effort Station (CES) and Rapid Ornithological Inventory (ROI) sites by station code, ownership, and location.

Station Name	Code	Ownership	Location
Eastside Cascade Range - Klamath Basin			
7-Mile Guardhouse Station CES	7MIL	USFS Winema NF	Seven Mile Creek, Winema NF, 6 miles W Fort Klamath, Klamath Co., OR
Antelope Creek CES	ANT1	USFS Klamath NF	Antelope Creek, 7 miles SSW Tennant, Siskiyou Co., CA
Rocky Point Cabin CES	CABN	USFWS Upper Klamath Lake NWR	Rocky Point, Pelican Bay, 23.0 miles NW Klamath Falls, Klamath Co., OR
Gerber Reservoir CES	GERB	BLM Lakeview District	Barnes Valley Creek, SE Gerber Resevoir, 15.5 miles S Bly, Klamath Co., OR
Johnson Creek CES	JOHN	BLM Ashland Resource Area	Johnson Creek, 19.2 miles ENE Ashland, Klamath Co., OR
Odessa Marsh Campground CES	ODES	USFS Winema NF	Odessa, Pelican Bay, 19.6 miles NW Klamath Falls, Klamath Co., OR
Frain Ranch Campground CES	TOPS	BLM Lakeview District	Topsy Grade at Frain Ranch Campground, 10.2 miles NW Dorris, CA, Klamath Co., OR
Veteran's Park ROI	VET1	Klamath Falls Parks Dept.	Veteran's Park, N shore Lake Ewauna, Klamath Falls, Klamath Co., OR
Williamson River Campground CES	WILL	USFS Winema NF	Williamson River, 5.5 miles NNE Chiloquin, Klamath Co., OR
Wood River Wetland CES	WOOD	BLM Lakeview District	Agency Lake, Wood River, 3.3 miles W Chiloquin, Klamath Co., OR
Westside Cascade Range - northern California and southern Oregon			
Box-O Ranch ROI	BOXO	BLM Cascade-Siskiyou NM	Box-O Ranch, Cascade-Siskiyou NM, 6.2 miles S Lincoln, Jackson Co., OR
Grayback Creek CES	GBCR	USFS Siskiyou-Rogue River NF	Grayback Creek, 11 miles SE Cave Junction, Josephine Co., OR
Horse Creek Meadow	HCME	USFS Siskiyou-Rogue River NF	Horse Creek Meadow, 13.0 miles W Merlin, Josephine Co., OR
Oregon Caves CES	ORCA	NPS Oregon Caves NM	Oregon Caves NP, 14.0 miles SE Cave Junction, Josephine Co., OR
Quines Creek	QUIC	BLM Medford District	Quines Creek 15 miles SSE Canyonville, Douglas Co., OR
Wildlife Images CES	WIIM	BLM Medford District	Wildlife Images, 3.5 miles SW Merlin, Josephine Co., OR
Willow Wind CES	WIWI	Ashland School District	Willow Wind Learning Center, Bear Creek, Ashland, Jackson Co., OR

Table 3. 2005 effort summary at nine Eastside Cascade - Klamath Basin constant-effort monitoring stations (CES) by all-season, breeding season, and fall migration season. [STATION (BLM = Bureau of Land Management, KFP = City of Klamath Falls Parks Dept., USFS = US Forest Service, USFWS = US Fish and Wildlife Service,); EFFORTS = number of visits to each site; RECAP, NEW, UNBANDED and TOTAL = number of previously banded birds, newly banded birds, birds released without being banded, and total number of birds captured respectively; AVERAGE SPECIES RICHNESS = average number of species captured each day; CENSUS = number of area search censuses conducted; NET HOURS = number of 12 m nets operated x time operated in hours; PERSON DAYS = number of person days spent; AVERAGE DAILY CAPTURES = average total captures per day; AVERAGE DAILY RECAPS = average recaptures per day; CAPTURES PER NET HOUR = average total captures per hour].

All-Season effort by Station

STATION CODE	STATION	EFFORTS	RECAP	NEW	UNBANDED	TOTAL	AVERAGE SPECIES RICHNESS	CENSUS	NET HOURS	PERSON DAYS	AVERAGE DAILY CAPTURES	AVERAGE DAILY RECAPTURES	CAPTURES PER NET HOUR
7MIL	7-Mile Guard Station (USFS)	22	125	703	40	868	14.2	38	1232.3	64	39.45	5.68	0.70
ANT1	Antelope Creek (USFS)	12	52	301	40	393	12.4	18	469.08	25	32.75	4.33	0.84
CABN	Rocky Point Cabin (USFWS)	23	73	1079	200	1352	14.3	35	1136	71	58.78	3.17	1.19
GERB	Gerber Reservoir (BLM)	15	48	312	29	389	11.2	23	715.53	36	25.93	3.20	0.54
JOHN	Johnson Creek (BLM)	14	62	456	28	546	13.2	26	851.35	36	39.00	4.43	0.64
ODES	Odessa Campground (USFS)	15	83	450	33	566	14.1	28	709.88	39	37.73	5.53	0.80
TOPS	Frain Ranch Campground (BLM)	13	127	523	47	697	14.8	20	624.33	33	53.62	9.77	1.12
VET1	Veteran's Park (KFP)	1	2	25	3	30	10.0	0	14.58	5	30.00	2.00	2.06
WILL	Williamson River Campground (USFS)	15	120	487	37	644	14.1	26	804.59	41	42.93	8.00	0.80
WOOD	Wood River Wetland (BLM)	16	114	441	29	584	10.4	27	755.07	40	36.50	7.13	0.77
TOTAL		**146**	**806**	**4777**	**486**	**6069**		**241**	**7312.71**	**390**			

Breeding Season effort by Station

STATION CODE	STATION	EFFORTS	RECAP	NEW	UNBANDED	TOTAL	AVERAGE SPECIES RICHNESS	CENSUS	NET HOURS	PERSON DAYS	AVERAGE DAILY CAPTURES	AVERAGE DAILY RECAPTURES	CAPTURES PER NET HOUR
7MIL	7-Mile Guard Station (USFS)	15	94	427	32	553	12.3	25	809.10	41	36.87	6.27	0.68
ANT1	Antelope Creek (USFS)	7	43	97	11	151	12.0	8	243.25	13	21.57	6.14	0.62
CABN	Rocky Point Cabin (USFWS)	9	31	233	132	396	12.6	12	429.17	21	44.00	3.44	0.92
GERB	Gerber Reservoir (BLM)	9	23	136	12	171	9.7	16	448.53	21	19.00	2.56	0.38
JOHN	Johnson Creek (BLM)	8	33	228	15	276	12.6	13	489.18	21	34.50	4.13	0.56
ODES	Odessa Campground (USFS)	9	69	202	11	282	13.8	16	426.80	23	31.33	7.67	0.66
TOPS	Frain Ranch Campground (BLM)	8	108	328	30	466	15.8	13	389.33	21	58.25	13.50	1.20
VET1	Veteran's Park (KFP)	1	2	25	3	30	10.0	0	14.58	5	30.00	2.00	2.06
WILL	Williamson River Campground (USFS)	10	68	207	14	289	11.3	18	530.37	24	28.90	6.80	0.54
WOOD	Wood River Wetland (BLM)	9	108	211	14	333	11.3	14	438.17	23	37.00	12.00	0.76
TOTAL		**85**	**579**	**2094**	**274**	**2947**		**135**	**4218.48**	**213**			

Fall Migration Season effort by Station

STATION CODE	STATION	EFFORTS	RECAP	NEW	UNBANDED	TOTAL	AVERAGE SPECIES RICHNESS	CENSUS	NET HOURS	PERSON DAYS	AVERAGE DAILY CAPTURES	AVERAGE DAILY RECAPTURES	CAPTURES PER NET HOUR
7MIL	7-Mile Guard Station (USFS)	7	31	276	8	315	16.0	13	423.20	23	45.00	4.43	0.74
ANT1	Antelope Creek (USFS)	5	9	204	29	242	12.8	10	225.83	12	48.40	1.80	1.07
CABN	Rocky Point Cabin (USFWS)	14	42	846	68	956	15.9	23	706.83	50	68.29	3.00	1.35
GERB	Gerber Reservoir (BLM)	6	25	176	17	218	12.7	7	267.00	15	36.33	4.17	0.82
JOHN	Johnson Creek (BLM)	6	29	228	13	270	13.8	13	362.17	15	45.00	4.83	0.75
ODES	Odessa Campground (USFS)	6	14	248	22	284	14.3	12	283.08	16	47.33	2.33	1.00
TOPS	Frain Ranch Campground (BLM)	5	19	195	17	231	13.8	7	235.00	12	46.20	3.80	0.98
WILL	Williamson River Campground (USFS)	5	52	280	23	355	16.8	8	274.22	17	71.00	10.40	1.29
WOOD	Wood River Wetland (BLM)	7	6	230	15	251	9.4	13	316.90	17	35.86	0.86	0.79
TOTAL		**61**	**227**	**2683**	**212**	**3122**		**106**	**3094.23**	**177**			

Table 4. 2005 effort summary at four Westside Cascade - southern Oregon constant effort monitoring (CES) and one Rapid Ornithological Inventory (ROI) sites by all-season, breeding season, and fall migration season. [STATION (ASD = Ashland School District, BLM = Bureau of Land Management, NPS = National Park Service, USFS = US Forest Service); EFFORTS = number of visits to each site; RECAP, NEW, UNBANDED and TOTAL = number of previously banded birds, newly banded birds, birds released without being banded, and total number of birds captured respectively; AVERAGE SPECIES RICHNESS = average number of species captured each day; CENSUS = number of area search censuses conducted; NET HOURS = number of 12 m nets operated x time operated in hours; PERSON DAYS = number of person days spent; AVERAGE DAILY CAPTURES = average total captures per day; AVERAGE DAILY RECAPS = average recaptures per day; CAPTURES PER NET HOUR = average total captures per hour].

All-Season effort by Station

STATION CODE	STATION	EFFORTS	RECAP	NEW	UNBANDED	TOTAL	AVERAGE SPECIES RICHNESS	CENSUS	NET HOURS	PERSON DAYS	AVERAGE DAILY CAPTURES	AVERAGE DAILY RECAPTURES	CAPTURES PER NET HOUR
BOXO	Box-O Ranch (BLM)	2	5	61	5	71	15.5	4	99.75	12	35.50	2.50	0.71
GBCR	Grayback Creek (USFS)	13	35	117	6	158	6.7	23	502.15	24	7.92	2.15	0.31
HCME	Horse Creek Meadow (USFS)	13	66	495	29	590	14.0	24	318.64	28	22.23	3.00	1.86
ORCA	Oregon Caves National Monument (NPS)	13	55	293	27	375	9.9	25	645.28	32	15.69	2.08	0.58
QUIC	Quines Creek (BLM)	24	66	361	23	450	9.1	45	1193.5	48	18.75	2.75	0.38
WIIM	Wildlife Images (BLM)	26	364	1163	92	1619	14.0	45	1405.2	67	62.27	14.00	1.10
WIWI	Willow Wind (ASD)	20	99	616	52	767	11.6	32	953.25	61	38.35	4.95	0.89
TOTAL		**109**	**690**	**3106**	**234**	**4030**		**198**	**5117.77**	**272**			

Breeding Season effort by Station

STATION CODE	STATION	EFFORTS	RECAP	NEW	UNBANDED	TOTAL	AVERAGE SPECIES RICHNESS	CENSUS	NET HOURS	PERSON DAYS	AVERAGE DAILY CAPTURES	AVERAGE DAILY RECAPTURES	CAPTURES PER NET HOUR
BOXO	Box-O Ranch (BLM)	2	5	61	5	71	15.5	4	99.75	12	35.50	2.50	0.71
GBCR	Grayback Creek (USFS)	8	28	71	4	103	6.6	13	302.15	15	12.88	3.50	0.34
HCME	Horse Creek Meadow (USFS)	7	39	232	18	289	14.7	12	168.22	13	41.29	5.57	1.72
ORCA	Oregon Caves National Monument (NPS)	7	27	161	16	204	10.4	13	350.83	17	29.14	3.86	0.58
QUIC	Quines Creek (BLM)	11	32	233	15	280	10.7	19	559.33	22	25.45	2.91	0.50
WIIM	Wildlife Images (BLM)	9	82	340	25	447	12.8	13	471.82	21	49.67	9.11	0.95
WIWI	Willow Wind (ASD)	12	41	196	17	254	9.1	21	566.47	31	21.17	3.42	0.45
TOTAL		**54**	**254**	**1294**	**100**	**1648**		**95**	**2518.57**	**131**			

Fall Migration Season effort by Station

STATION CODE	STATION	EFFORTS	RECAP	NEW	UNBANDED	TOTAL	AVERAGE SPECIES RICHNESS	CENSUS	NET HOURS	PERSON DAYS	AVERAGE DAILY CAPTURES	AVERAGE DAILY RECAPTURES	CAPTURES PER NET HOUR
GBCR	Grayback Creek (USFS)	5	7	46	2	55	6.7	10	200.00	9	11.00	1.40	0.28
HCME	Horse Creek Meadow (USFS)	6	27	263	11	301	13.3	12	150.42	15	50.17	4.50	2.00
ORCA	Oregon Caves National Monument (NPS)	6	28	132	11	171	9.4	12	294.45	15	28.50	4.67	0.58
QUIC	Quines Creek (BLM)	13	34	128	8	170	7.4	26	634.17	26	13.08	2.62	0.27
WIIM	Wildlife Images (BLM)	17	282	823	67	1172	15.2	32	933.38	46	68.94	16.59	1.26
WIWI	Willow Wind (ASD)	8	58	420	35	513	14.1	11	386.78	30	64.13	7.25	1.33
TOTAL		**55**	**436**	**1812**	**134**	**2382**		**103**	**2599.2**	**141**			

Table 5. 2005 Black Tern survey effort summary by location. [Visit = number of visits; Survey Routes = number survey routes followed using the revised protocol; Maximum Count = maximum count of Black Terns encountered on a survey route; Breeding = the determined status of at least one breeding colony (Y = active , N = not active, P = possibly active), Notes = and the behavior observations used to determine breeding colony status (NF = nest found, NB = nesting Behavior, D = diving, V = vocalizing, J = juvenile, O = other)]

Area	Visits	Survey Routes	Maximum Count	Breeding Status	Observation Note
Agency Straits	1	5	16	P	V
Canals along the Levee (NW Upper Klamath Lake)	1	6	6	P	**D**
Klamath Marsh	1	1	3	N	W
Odessa Creek and Spring	1	2	8	Y	V
Odessa Marsh	1	1	3	N	F
Malone Springs	1	1	0	N	
Northwest edge of Upper Klamath Lake, along marsh border	1	3	7	Y	V
Pelican Bay	1	6	30	Y	V
Recreation Creek	1	1	4	P	D
Wocus Cut	1	2	4	Y	V
Wood River Wetland	1	1	1	P	V
TOTAL		**29**			